

The arrogant spirit of man revolts against the idea of its so-called bodily shell being a mere natural product, just like every other organized structure; but, for all that, the universal morphological law still remains. Art alone transcends all the requirements of natural production. Where art comes in play, the individual disappears; the contingent gives way before the eternal, the permanent. But this is a harmony that is never attained by Nature.—*Die Natur*.

THE CONFESSION OF A REFORMED SMOKER.

A RECORD OF OBSERVATIONS AND EXPERIMENTS CONCERNING THE PHYSIOLOGICAL ACTION OF TOBACCO.

By FRANCIS GERRY FAIRFIELD.

IN submitting the following observations as to the physiological effect of smoking, it is not my intention to discuss the tobacco question in an exhaustive manner, but, on the other hand, to limit my remarks to experiments tried and recorded in the course of the year ending July 10, 1874, and to the more general memoranda of the previous twelve years, during which the habit was formed, and, with the exception of brief paroxysms of abstinence, steadily developed. Many will no doubt dissent from the conclusions at which I arrived: to whom I have only to reply that my observations and experiments have not been, save in a cursory memorandum now and then, extended beyond my own person, and represent uniquely the manner in which I have been individually affected by habitual smoking. So far as I have any opinion to express, it consists of induction from actual experiments, and of inferences from actual symptoms; and, if I seem to leave many points undetermined, it must be set down to the fact that they are not within the scope of the particular method I have followed. That tobacco differently affects different temperaments there is no doubt. That different grades and qualities of tobacco differ materially in their physiological action, in manner and symptom, if not essentially, is demonstrated by experiment. In smoking, even, to say nothing of other forms of the tobacco-habit, it makes a material difference whether the same quality is used in conjunction with the pipe or consumed in the form of the cigar—a fact mainly due, no doubt, to the escape of the pyreiline, a base of extreme volatility, in cigar-smoking, and to its conservation to a greater extent in pipe-smoking. Yet, making all due allowances for differences of temperament, for the bias of transmitted habit, and for idiosyncrasies developed by special circumstances, I am constrained to the conclusion that, in the majority of instances, the habit of smoking is productive of nervous degeneracy.

My own case is possibly an extreme one, though not, I am inclined to think, to the extent of vitiating its application to the majority. My father used tobacco. My grandfather on my mother's side, a physician by profession, whose physical and mental traits I inherit to a considerable extent, was a moderate smoker; whether my paternal grandfather used the weed I have no means of ascertaining. I may add, however, that its use is pretty common among the collateral limbs radiating from the family trunk, and that there is hence no reason for regarding the phenomena in my case as the results of constitutional antagonism to the narcotic.

I have been a smoker, or had been up to July, 1874, for thirteen years, having commenced at the age of twenty-two. During the first three years I was somewhat irregular in my habits, sometimes smoking a pipe, sometimes consuming cigars at the rate of from three to five per day; and sometimes refraining altogether for from three days to a week.

I am of cerebro-muscular temperament; of slender *physique*, though broad-shouldered; with great physical endurance conjoined to peculiar sensitiveness of nervous organization, am yet not liable to the nervous excitability generally associated with sensitiveness. Opium and its preparations take their normal narcotic effect in very minute doses, inducing languor and drowsiness within a few minutes after administration. No tendency to talk precedes narcotism, nor is the slightest tendency to fantasy developed by the drug. Hasheesh acts in a manner analogous to morphia, bringing on stupor at the moderate dose, but engendering none of those deliciously intangible sensations which are so generally attributed to its action by Bayard Taylor and others who profess to have experimented with it.

Alcoholic stimulants act limitedly as excitants, but powerfully and rapidly as sedatives. I soon fall asleep under the action of whiskey and brandy. Wines, also, are generally sedative; but ale acts as a stimulant to the brain and nerve-centres with unerring certainty of effect, while its sedative action is long postponed and extremely unreliable. Have never used stimulants habitually, or even with ordinary frequency. Have taken morphine in quarter-grain doses, or the equivalent in laudanum, a dozen times, possibly, in the course of as many years. Am regular in my habits, temperate, and accustomed to protracted intellectual effort; inherit a narcotic tendency from my father, which exhibits itself in peculiar psychical phenomena whenever defective nutrition or protracted nervous tension is permitted.

One idiosyncrasy is worth noting at this stage of the narrative. Although I have smoked habitually for ten years, I have never been able to take tobacco in my mouth without violent nausea, or even to retain a cigar between my teeth; and have always been compelled to remove my cigar frequently from my lips and to carry it between my fingers, when not in actual use. In short, the slightest and most mo-

mentary contact of tobacco with the nerves of taste produces instant and uncontrollable nausea, though I am exceedingly fond of smoking, and have always been reckoned a connoisseur in flavors. I should add, however, that offensive sights, as of a person deformed or idiotic, and offensive odors, have the same effect, and instantaneously produce violent nausea.

The physiological effect of tobacco, when I first began to use it, was intense and disagreeable, producing contraction of the pupil of the eye, dizziness, labored breathing, and considerable tendency to spasms; and as these symptoms were more marked with the pipe than with the cigar, in which the pyrieline is mostly disengaged by the surrounding atmosphere, I conclude that they were due in the main not to the nicotine, but to the pyrieline and picoline bases, which are more immediately responsible for the first poisonous action of tobacco-juice when swallowed. Their action is more rapid when taken internally than when subcutaneously injected; and, though substantially identical with that of nicotine, is rather less distinctly narcotic, rather less immediately nervous, and rather more definite in its tendency to produce convulsions. As the nerves become habituated to the narcotic, a state of pleasant and exhilarated reverie, after smoking a few minutes, superseded the more obtrusive symptoms, and lasted sometimes half an hour or more, when languor supervened; and, as the habit became settled, it was accompanied by a mental aura, marked by general tendency to abstraction, and by a dreamy, metaphysical habit of thought. Vague generalizations took the place of real observation in the physical sciences to a greater extent than is compatible with progress in physics. I was intolerant of particulars, and impatient with nicety of discrimination, although I had previously been of extremely analytic habit, and noted in the academy and at college for subtilty as an algebraist. I had my logic of shadows and reveries, and was, withal, a little inclined to mysticism after the German pattern, and to vast theological speculations.

At the same time there was some gain in repose of nerve from the use of the weed, and some trifling gain in mental concentration, particularly as respected the study of Hegel, Schelling, Kant, and the German metaphysicians at large, which happened just then to be in my way. Hegel's *anima mundi* and I were on terms of familiar intimacy, and Schelling's fine discrimination between the different shades of shadows was accepted as really valuable in its contributions to philosophical literature. I mean no disrespect to Hegel and Kant, whose definition of life as self-aim has the merit of brevity, and will, perhaps, by-and-by, have to be incorporated into biology; only generalizing is by so many degrees easier than investigation that men come, I think, sooner or later—some sooner, some later—to have a kind of contempt for mere metaphysical speculation, however imposing its painted bubbles of imagined reality, and to long for a little truth

founded on fact, not on mysterious trains of ratiocination, having no basis except an introspective one.

On the other hand, there was some loss of sympathy with life. The actual was hazy and Rembrandtish. Day in and day out I speculated on Hegelian nothings—mere dodges in words—as if they had been underlying principles; and it was not until years after, when the passion for physics had possessed me, that it occurred to me that the *anima mundi* was but an ancient whim under a new name, and that the infinite potentiality which the Hegelists talk about was simply a symbol in nine syllables for something that in plain English (or German) is expressed in one—a gain in grandeur of phrase to be sure, but no real gain in other respects.

That these paragraphs fairly contrast the psychological exponents of the tobacco-habit with the normal condition of my mind, I have been able to satisfy myself by many experiments. By refraining from the use of tobacco for three or four weeks, on a few occasions longer than that, I have returned to the old dramatic sympathy with life; while, by taking up the habit again, I have leaped in a day from the one condition to the other. This experiment I have repeated many times within the past five years, always with the same transition from one series of psychological experiences to the other and very different series. I fancy Nero must have been a smoker, though there is no record of tobacco in those days; for a great deal that passes for firmness, and not a little that passes for cruelty, in this world, is but the apathy of narcotism in its maturer stages. Indeed, it is an open question whether the tobacco-habit was not largely instrumental in engendering the peculiar stoicism of the American Indian and in promoting its culture.

As the process of narcotizing is persisted in, languor attacks the will, there is sinking at the heart on waking up in the morning, the system craves stimulants with a mighty and unappeasable craving, and the motor centres respond but numbly to the motions of consciousness. The incapacity to recollect that marks the advanced stage is clearly the result of languid volition, engendered by torpor of the motor centres.

These symptoms indicate that the great nervo-vital centre, the medulla oblongata, which distributes its forces alike to body and brain, coördinated now as vital phenomena, now as psychical phenomena, is more or less involved, and that vital paralysis is liable to supervene at any juncture. But even at this stage the symptoms yield so rapidly to abstinence as to leave no doubt in my mind that the specific influence of the tobacco is transmitted directly to the great vital tract by means of the pneumogastric nerve. The depressed action of the heart, long before the cerebral centres are involved, points directly to this conclusion, and the augmented gastric and salivary secretions indicate the same avenue of action. The tendency to congestion of the lungs

that accompanies the tobacco-habit also sustains this hypothesis; and this may be produced in animals by introducing a very minute dose of decoction of tobacco into the system by way of the mouth, while subcutaneous injection is not equally rapid in producing this special result, nor, indeed, in producing death. Nor have I any doubt, from the few experiments I have tried, and the many I have witnessed, that, in opium-smoking, the peculiar symptoms are occasioned by a similar action of the vapor of the drug (on the medullary tract by way of the pneumogastric nerves). The olfactory nerves are, of course, more or less affected, and transmit the specific influence of either drug directly to the interior lobes of the brain; but experiment and observation alike tend to the conclusion that, though dizziness is somewhat accelerated by this action, it is trifling even in its cerebral effect, and that the great thoroughfare of activity is by way of the pneumogastric. The disturbances in locomotion arising from tobacco are thus secondary effects propagated, not by way of general nervous disturbance, but by direct appeal to the great coördinating centre, the cerebellum, through the near-lying and directly-connected vital tract. The vertiginous symptoms that accompany disturbances of the latter class must not be confounded with those that originate by way of the olfactory nerves, as the whirling sensation is far more marked and distinct in cerebellar disturbances, while the tendency to unconsciousness is somewhat less so.

I am, in these remarks, let it be understood, simply giving the results of my own observations on my own person during the last thirteen years; and my conclusion, from the masses of data thus accumulated, is, that the great sensory and motor tract of gray neurine, known as the cortex, is not at all involved in the primary stages of the narcotism induced by smoking, though the reverse is often clearly true in the instance of opium, with its surer and swifter cerebral effect. Others may be very differently affected by habitual smoking. I simply contribute my leaf to the record; and, although I am not satisfied that the tobacco-habit ever produces neurosis, I am satisfied that it is often the exciting cause of nervous disorder in cases where the neurotic tendency exists, and that in these cases it is productive sometimes of morbid moral phenomena, in a degree only less marked than the epileptic aura, and penetrating to the very roots of volition and ethical emotion. My opportunities for observation in hospitals and asylums have not been extensive enough to permit me to pronounce definitely on the point I am about to suggest; but it is my impression that the larvated type of epilepsy occurs more frequently than any other among persons addicted to tobacco, and that the habit is very generally influential in the larvation of nervous maladies. Statistics only can settle this issue, which must be left to the consideration of medical psychologists.

In order that the lay reader may clearly apprehend the various

bearings of the facts, and the intimate relation of the diverse symptoms to each other in tobacco-sickness, it is, perhaps, necessary to map out the pneumogastric nerve and indicate its function, which is not fairly deducible from its name. The origin of nearly every pair of cranial nerves has been traced into the vital bulb, the medulla oblongata, or continuation and expansion of the spinal cord as it passes into the cranium, to blossom into the complex structure of the brain. This tract enters the cranium in six bodies, united in a bulb, and continuing the six strands of the marrow, namely—the two pyramidal continuing the anterior white strands of the spinal stem, the two olivary the interior and partly lateral strands of gray neurine, and the two restiform (*corpora restiforma*) the posterior white strands. There are two ways of dissecting a brain, each of which has merits of its own for special purposes. The first and more general consists in examining the encephalic mass from above downward, by removing it in successive slices. For descriptive anatomy, and for pathological examination, this method is perhaps preferable. The second consists in examining and unraveling the structure from the spinal bulb upward, by tracing its fasciculi as they expand, radiate, and enlarge; and I am inclined to think that this method has its advantages in tracing the genesis of psychical phenomena. To this bulb all the complex activities of the cerebro-spinal axis finally refer themselves: it is properly the calyx from which spring the three ganglionic masses—the mesocephale, cerebellum, and cerebrum. The *par vagum*, generally known as the pneumogastric nerves, spring laterally from this bulb, and properly include three pairs of nerves, namely—the glosso-pharyngeal, which supply the base of the tongue with sensation, and connect and coördinate the motions of the organ with those of the pharynx and of the digestive function; the pneumogastric, which, with the preceding, have their origin in filaments springing from the groove between the olivary and restiform bodies; lastly, the spinal accessory, originating laterally from the medulla spinalis, but joining the main stem near its ganglion, and distributed to the lateral muscles of the neck. From the cervical tract of this nerve, which is triple in its origin, spring filaments or strands that join the sympathetic and lingual nerves, others that proceed directly to the pharynx, and still others known as its cardiac ramifications. The superior laryngeal nerve, distributed to the upper portion of the larynx, and the recurrent nerve, distributed to the muscles of the larynx, are both portions of the pneumogastric system. This pair of nerves passes through the jugular foramen just anterior to the vein of the same name, and separates into three parts. In the foramen it presents a ganglionic expansion, and below it a long gangliform swelling which communicates with the facial, spinal accessory, sympathetic, glosso-pharyngeal, and superior spinal nerves—all of which are here gathered into a kind of elongated plexiform bundle. At this point the nerve has the compact-

ness and grayish tint of the ganglion. The pneumogastric portion now descends, passing before the lingual nerve and the jugular vein for a little distance, then behind, inclosed in the sheath of the carotid artery and jugular, rather closer to the vein than to the artery, to which it gives off filaments. The importance of this system will be evident when it is stated that it is principally concerned in the coördination of the functions of deglutition, articulation, respiration, circulation, and digestion. The three great functions of animal life, nutrition, respiration, and circulation, are, in briefer terms, mainly co-ordinated by the par vagum in its cervical, thoracic, and abdominal tracts. With the former and its filaments, and to a considerable degree with the thoracic, the specific influence of the tobacco has, in smoking, a contact exceedingly direct and protracted; and, if the general reader will trouble himself to map out in his own imagination the course, ramifications, and connections, of the pneumogastric system, he will see clearly that the congeries of symptoms occasioned by the initial cigar follows out, step by step, the complex relations of this tract to the vital functions, and that the physical and psychological exponents of the habit in its established stages are, similarly, the natural results of narcotism of this system, and of the great vital centre from which it springs.

To these general facts of observation let me now append the details of a series of experiments:

I had been an inveterate smoker for eight years, when, in the summer of 1872, certain symptoms resembling those of writer's cramp attacked the right arm, and gradually, though to a less alarming extent, enveloped the left. Physicians pronounced it a genuine case of writer's cramp; but, owing to the persistent absence of certain symptoms, among them brittleness and want of color in the finger-nails, I was slow to accept the conclusion. There was reason enough why excessive scribbling should bring on the affection; but I was, nevertheless, doubtful, though I so far complied with the prescription as to have recourse to the ordinary electrical appliances insisted upon by Dr. Poore, in his admirable essays on the subject, which embody, in brief form, the memoranda of an expert of some years' practice.

As I half anticipated, the application was without material benefit. Tonics and nervines proved equally inefficacious, and for a year, with short intervals of relief, affairs did but get worse and worse. Blue ink, elastic pen-holders, and broad-nibbed pens, were altogether incapable of ameliorating the affection or mending the scrawling, irregular handwriting that resulted from it; and so essential is it that the hand and mind should work together in a kind of rhythm, in order to form a good style, or to preserve it when formed, that any affection of the nerves of the arm that breaks up this rhythm is nearly as fatal to the poet, essayist, and novelist, as to the artist or the pianist; and I soon found my sentences as cramped and dissonant as my manuscript.

In October, 1873, I started for the country on a brief furlough, having served through the heat of the summer as a member of the staff of the *Evening Post*, and, not finding the tobacco to my liking, was forced to be exceedingly temperate for several weeks. Slowly, yet perceptibly, the affection of the arms wore off. The hand and forearm were less numb when I woke up in the morning, and my handwriting began to assume its former continuity. This I attributed at first to rest, fresh air, and freedom from worry—an error in the main, as will presently appear, though a very natural one under the circumstances.

I had been at home four or five weeks when I succeeded in supplying my commissary department with a sufficiency of the weed of the required quality, in the mean time smoking a little undoctored Connecticut leaf, when the craving became too strong to be comfortably resisted, but consuming, probably, less than two ounces a week. Upon resuming my usual quantum, and within twenty-four hours after the resumption, my arms were as troublesome as ever, and no rest in the least availed to soften the shooting pains or dissipate the numbness (penetrated as if with lances of neuralgia) that enveloped the arm from the wrist to the shoulder. I was thoroughly dispirited, and contemplated shifting my profession and applying for admission to the bar. I did not yet suspect the relation between the tobacco-habit and the malady under which I was suffering.

Remaining in the country, however, longer than I at first intended, my supply of the weed ran out; and I was again reduced to vulgar rations of Connecticut leaf, of which I consumed the smallest quantity possible. The consequence was an immediate reduction of the pain and numbness in my arms. In the course of this somewhat intermittent use of the narcotic, I observed also that a certain cloudiness of recollection, and a slight tendency to aphasia—the latter due, probably, to action on the lingual nerve—followed the resumption of the full dose after an interval of abstinence, the former interfering materially with the opulence of illustration necessary to a good style, the latter annoying me now and then with slips of the tongue in ordinary conversation.

At this stage of the investigation, with the barest suspicion in my mind that tobacco was responsible for most of the ills my flesh had fallen heir to, or rather my nerves, I returned to New York in the latter part of December, and initiated a series of experiments, with a view to test the physiological action of the various brands, and to verify or disarm the suspicion.

December 26th.—Procured a quantity of Cuban tobacco known as Honradez, an extremely fine brand, and put myself on a ration of half an ounce per day. Continued this regimen for twelve days, without perceptible alteration in the symptoms so far as my arms were concerned.

29th.—After three days of Honradez regimen, slight tendency to tremor and sleeplessness, with exceeding dryness of the membrane lining the nose.

January 1st.—Accelerated tendency to tremor and sleeplessness. Went to bed at eleven o'clock, but did not finally lose myself until after the clock struck one; then wandered off into dream-land instead of dropping to sleep in the normal way. Dreams of a queer, trance-like cast, with occasional starts. (I should interpolate here that I usually fall asleep very quickly after going to bed, and sleep very soundly.)

4th.—Augmented tendency to tremor and sleeplessness, with occasional *secousses* of the limbs. Arms still as benumbed as ever, but with an uncomfortable tendency to jerk. Went to bed at eleven o'clock, but lay awake till after the clock struck three; then fell into a fitful but trance-like slumber.

5th.—Came out of my drowse by slow degrees, and breakfasted about ten o'clock. Irritable and peevish. Tried to write after breakfast, but my hand was too shaky. Smoked a pipe of Honradez, which seemed to subdue the tremor.

7th.—Increased tremor and sleeplessness. Went to bed as usual at eleven, but could not sleep. Took an anodyne (bromide of potash) at half-past three o'clock, and slept soundly until eleven the next morning.

I now increased the ration of Honradez to three-fourths of an ounce per day, with an intensification of the symptoms so rapid and determinate as to leave no doubt of their origin. I was wild with nervousness, yet could not sleep soundly, and invariably woke up in the morning with a more or less pronounced pain in the region of the corpora striata (across the forehead) shooting downward and backward to the base of the brain; but the symptoms were still limited to the motor tract (the corpora striata and its connections), and there were no perturbations of the sensory.

Weighed 121 lbs. 3 oz. when I commenced the experiment, and 120 lbs. 2½ oz. when it was concluded. It should be unnecessary to add that a carefully-regulated dietetic regimen accompanied the experiments from beginning to end, securing at once fullness and variety of nutrition.

11th.—Refrained altogether from the use of tobacco. Fell asleep several times during the day. Went to bed at a quarter before eleven, and was asleep before the clock struck. Slept, with occasional whiffs of dream, until half-past eight in the morning. Continued to abstain for ten days, the nervous system gradually recovering its tone, and the hours of sleep slowly retracting until they fell to a trifle less than eight. An increased craving for food, and relish for it, followed the first day's abstinence, and on the morning of January 12th I ate

my broiled steak and drank my cup of coffee with a relish to which I had long been a stranger. The longing for tobacco did not recur strongly until the third day, when it was so importunate that, had I not been trying an experiment, it would have triumphed over all scruples.

Mentally, during the ten days, I was as one coming to himself after a long drowse—an Epimenides recovering from weeks of trance; and, after the third day, during which I suffered from a dull, continuous pain at the base of the brain, in the medullary rather than the cerebellar region, the numbness began to disappear from the arms, which continued to improve pending the progress of the experiment.

21st.—Weighing 122 lbs. 6 oz., put myself on an allowance of three Reina Victoria (Regalia) cigars per day, one after each meal, and continued the regimen for ten days, with the same general result that had followed the pipe and Honradez regimen, but somewhat less marked in its nervousness and tendency to tremor.

31st.—Weighed 120 lbs. 15 oz., and smoked my last Reina Victoria.

February 1st.—Commenced another ten days of abstention, with recovery from the symptoms, at the expiration of which my weight was 122 lbs. 13 oz.

11th.—Placed myself on an allowance of a quarter of an ounce perique per day. The first day I suffered from dizziness after smoking, and from slight nausea while in the act. These symptoms disappeared on the second day. The use of this tobacco (a strong Louisiana variety) was not attended with the marked tendency to tremor and sleeplessness incident to Honradez, but with a marked narcotism of the motor tract, and a marked vital depression—the specific action, no doubt, of its excess of nicotine on the great nervo-vital centre, the medulla oblongata. On the fourth day a peculiar sinking at the heart kept me in bed half an hour later than usual in the morning, but a cup of strong coffee taken in bed dissipated the lassitude and restored the vital energy. The numbness in my arms grew more and more pronounced every day, until it required some minutes in the morning with the flesh-brush to readjust the circulation; and with this came a tendency of the legs to fall asleep, showing obstructed nervous circulation, to be followed, in the nature of things, by defective nutrition and ultimate paralysis. During the last two days of the experiment the vital depression became so oppressive that I resorted to brandy in doses of a tablespoonful three times a day. Lost 1 lb. 11½ oz. during the experiment.

Discarding the perique, with its excess of the nicotine, I now limited myself to three pipes of Honradez per day, with a resultant consumption of two ounces a week. This regimen I maintained until the first of April, when I put myself on a daily allowance of a quarter of an ounce of Virginia cavendish; but the vital depression was so rapid that I desisted from the experiment after four days of lassitude.

April 10th.—Left New York for the country a thorough valetudi-

narian ; and, after abstaining for a few days, with a rapid recovery from the symptoms, commenced to smoke a specific allowance per day of Connecticut, four pipes in fact, which I continued until the first of June, with less vital depression than was produced by perique and cavendish, but with a distinct tendency in that direction, and with a more marked cloudiness of recollection than had followed either.

June 1st.—Withdrew the allowance of leaf and commenced to smoke irregularly an occasional cigar, scarcely one per day on the average, and to note the effect. The vital depression consequent upon a single cigar was often so great as to compel resort to quinine in two-grain doses. Finally, discarded the habit altogether, with sufficient benefit to the arms to assure me that the symptoms were contingent on the use of tobacco. The numbness had almost disappeared in three weeks of abstinence ; I began to wake up refreshed in the morning, not in a vital swoon. My weight, July 10th, was 125 lbs. 3 oz., and I regarded myself as thoroughly convalescent of the habit, though still a Laocoon struggling with his serpents. A violent agitation of the mucous membrane lining the nose has, I should have stated in its proper place, attended every withdrawal of the narcotic, supervening on the second day. The throat has also been considerably affected at these crises, and all the phenomena of a violent cold have been brought on in a few hours ; but whether these effects have been mainly due to the withdrawal of the heat evolved in smoking, or to recovery of the membrane from local narcotism, or whether in part to both, I cannot venture to say.

Omitting all details of analysis of different tobaccos as too familiar for repetition, my experiments have led me to conclude :

1. That nicotine is the special agent concerned in vital paralysis and in disturbances of muscular coördination, and that its action upon the medullary centres is propagated by way of the pneumogastric nerve ; that the cerebellar centres (coördinating the muscles concerned in locomotion), and the corpora striata (or great motor ganglia of the cerebrum), are next affected ; in other words, that the motor tracts follow the vital in yielding to the influence of the poison.

2. That the cortex of the brain is the last to be affected by nicotine, but is more specifically affected by the pyrieline, picoline, and collidine bases. Hence the difference in physiological action between Honradez, with its minimum of nicotine, and perique and cavendish, with their excess ; also the analogous difference between Havana cigars and cigars manufactured from Connecticut leaf.

3. That smoking is often the exciting cause of the various neuroses, and always a fruitful source of local aneurism, by impairing the nervous circulation and laying the foundation for defective nutrition in various directions. Cessation from tobacco should be made a condition precedent to medical treatment in writer's cramp and nervous affections of that type (the paralytic).

I am not going to take any radical ground on the tobacco question in its general aspects. Every man must judge for himself, and experiment for himself, as to the physiological action of the weed. I have simply recorded my own experiences and experiments, and the conclusions to which they have impelled me. I will not even say that I shall never smoke another cigar, for temptations are often strong and sudden; but I will say that, in such an event, I should regard myself as the victim of a nervous infirmity, not as one merely indulging himself in a harmless and pleasant luxury—of a devil far easier to get out of the bottle, to apply a Moslem legend, than to get back and cork in again.



WOMAN SUFFRAGE AS AFFECTING THE FAMILY.¹

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I NOW turn to a side of the question on which Mr. Smith lays very great stress, and of which I am not in the least disposed to under-rate the importance—the extension of the suffrage to married women. I do not yield to Mr. Smith, or to any one, in the firmness of my conviction that the family is at the bottom of our existing civilization, and I should, for my part, regard as dearly purchased any gain in material or political well-being which should introduce a jar or weakness into this pivot of our social system. But I believe that to open political life to women, far from being fraught with the disastrous consequences Mr. Smith anticipates, would, taking things in their entire scope, be productive of quite opposite effects. If I were asked to name the principal element of weakness in the family as things now stand, I should have no hesitation in pointing to the want of sufficient subjects of common interest between man and woman. It is owing to this that matrimonial engagements are entered into so rarely on the basis of any broad intellectual sympathy, such as might furnish some security for lasting affection, and so often at the bidding of impulses and fancies that do not outlive the honey-moon; and it is owing to the same cause that so very large a proportion of the lives of most husbands and wives are spent practically apart, with little or no knowledge on the part of either of the objects or aims that engross the greater portion of the other's thoughts and energies. That under such circumstances the marriage-tie is, on the whole, maintained as well as it is, seems rather matter for wonder; and to argue that the introduction of a new source of very profound common interest for husband and wife must of necessity weaken the bond, is, in my opinion, to

¹ Extracted from an article in *Macmillan's Magazine* for September, in reply to Goldwin Smith.